

Application Number 10/036,762
Responsive to Office Action mailed June 30, 2005

REMARKS

This amendment is responsive to the Office Action dated June 30, 2005. Applicants have amended claims 39, 40, 43, 47, 48, 50, 51, 54-58 and 61. Claims 39-62 remain pending.

Claim Objection

In the Office Action, the Examiner objected to claims 39, 40, 43, 48, 50, 51 and 54-58 for use of the phrase "adapted to". The Examiner asserted that use of this phrase is optional language according to MPEP 2106.II.C. Applicants have amended claims 39, 40, 43, 47, 48, 50, 51 and 54-58 to remove the phrase "adapted to" as requested by the Examiner. Applicants request withdrawal of the objection.

Claim Rejection Under 35 U.S.C. § 102

In the Office Action, the Examiner rejected claims 39-62 under 35 U.S.C. 102(e) as being anticipated by Erimli et al. (USPN 6,405,258). Applicants respectfully traverse the rejection. Erimli et al. fails to disclose each and every feature of the claimed invention, as required by 35 U.S.C. 102(e), and provides no teaching that would have suggested the desirability of modification to include such features.

In regard to Applicants' independent claim 39, Erimli et al. fails to teach or suggest a cross-bar switch comprising a set of input ports to receive data packets and a set of sink ports to accept and forward said data packets, wherein a first sink port includes a communication link interface including a Retry input. Claim 39 specifically requires that the first sink port responds to a signal on the Retry input by aborting transmission of a data packet, waiting a predetermined period of time, and transmitting the same first data packet again after waiting the period of time.

Consistent with these requirements, Applicants' specification describes a Retry input as an input to the sink port indicating that a device coupled to the sink port of the cross-bar switch cannot accept data.¹ In other words, when the cross-bar switch attempts to forward data from a sink port of the switch to an externally coupled device via a communication link, the sink port receives a signal on the Retry input if the device cannot accept the data.

¹ Applicants' Specification, pg. 22, ll. 21-23.

Application Number 10/036,762
Responsive to Office Action mailed June 30, 2005

In rejecting claim 39, the Examiner asserted that control logic (96) from FIG. 6 of the Erimli et al. reference is substantially similar to the Retry input as claimed. However, Erimli et al. teaches that the control logic continually monitors the status of output queues associated with the transmitting (input) and receiving (sink) output ports of a switch in order to detect when an output queue has reached the threshold value. When the output queue associated with the receiving output port has reached its threshold value, the control logic alerts the transmitting output port,² thereby effectively stalling transmission. Erimli et al. does not teach a Retry input or any other input to a sink (receiving) port that indicates that a device coupled to the sink port cannot accept data, as described by Applicants' claimed invention. Moreover, Erimli et al. describes flow control capable of stalling current output and fails to describe any form of a retry function.

Specifically, Erimli et al. also fails to describe the first sink (receiving) port responding to a signal on the Retry input by aborting transmission of a first data packet, waiting a predetermined period of time, and transmitting the first data packet after waiting the predetermined period of time, as recited by Applicants' independent claim 39. On the contrary, Erimli et al. describes the control logic implementing a flow control technique upon detecting that an output queue associated with a transmitting output port has reached its threshold value. A transmitting output port then generates a pause frame that causes a first network station to discontinue transmission of data frames to a second network station via the network switch. Once the first network station completes transmission of any data frame currently in progress, additional data frames that are queued for transmission will not be transmitted until the duration specified by the pause interface value expires.³ After the duration, the first network station continues to output new data, not previously sent data.

Erimli et al. does not describe aborting transmission of a first data packet upon receiving a signal on the Retry input. Instead Erimli et al. teaches continuing transmission of any data frame that is currently in progress when the pause frame is received. Erimli et al. also fails to describe transmitting the first data packet after waiting a predetermined period of time. As described above, Erimli et al. teaches completing the transmission of a first data packet and then

² Erimli et al., Col. 14, ln. 61-Col. 15, ln. 42.

³ Erimli et al., Col. 15, ll. 11-64.

Application Number 10/036,762
Responsive to Office Action mailed June 30, 2005

transmitting additional data packets stored in a queue when the specified pause interval has expired. Clearly, Erimli et al. fails to disclose a sink port capable of retransmitting the same data packet when a coupled device cannot accept the data packet on a previous transmission.

In regard to Applicants' independent claim 50, Erimli et al. fails to teach or suggest a sink port adapted to accept and forward data packets, the sink port comprising a storage buffer and an output port including a communications link interface, wherein the communications link interface includes a Retry input. As discussed above, the Retry input comprises an input to the sink (receiving) port indicating that a device coupled to the sink port cannot accept data. The Examiner again asserted that control logic (96) from FIG. 6 of the Erimli et al. reference is substantially similar to the Retry input as claimed. However, Erimli et al. does not teach a Retry input or any other input to a sink port that indicates that a coupled device cannot accept data, as described by Applicants' claimed invention.

In addition, Erimli et al. fails to describe the output port of the sink port responding to a signal on the Retry input by aborting transmission of a first data packet, waiting a predetermined period of time, and transmitting the first data packet after waiting the predetermined period of time, as recited by Applicants' independent claim 50. As discussed above, Erimli et al. does not describe aborting transmission of a first data packet upon receiving a signal on the Retry input. Instead Erimli et al. teaches continuing transmission of any data frame that is currently in progress when the pause frame is received. Erimli et al. also fails to describe transmitting the first data packet after waiting a predetermined period of time. Again, Erimli et al. teaches completing the transmission of a first data packet and then transmitting additional data packets stored in a queue when the specified pause interval has expired. Erimli et al. fails to disclose an output port capable of retransmitting the same data packet when a coupled device cannot accept the data packet on a previous transmission.

In regard to Applicants' independent claim 57, Erimli et al. fails to teach or suggest a system comprising a first cross-bar switch including a first set of input ports to receive data packets and a first set of sink ports to accept and forward the data packets, wherein a first sink port includes a first communications link interface including a Retry input, and a second cross-bar switch including a second set of input ports to receive data packets, wherein a first input port includes a second communications link interface including a first output in communication with

Application Number 10/036,762
Responsive to Office Action mailed June 30, 2005

the Retry input. As discussed above, the Retry input comprises an input to the first sink port of the first cross-bar switch indicating that the first input port of the second cross-bar switch cannot accept data. Erimli et al. does not teach a Retry input or any other input to a sink port of a first cross-bar switch that indicates that an input port of a second cross-bar switch cannot accept data, as described by Applicants' claimed invention.

Erimli et al. also fails to describe the first sink port of the first cross-bar switch responding to a signal on the Retry input from the first output of the second cross-bar switch by aborting transmission of a first data packet, waiting a predetermined period of time, and transmitting said first data packet after waiting said predetermined period of time, as recited by Applicants' independent claim 57. In the Office Action, the Examiner asserted that Erimli et al. describes transferring data between switches (12) with the same output ports used to transfer data between network stations (14). On the contrary, Erimli et al. teaches that each switch includes an expansion port (30) for transferring data between the other switches. Instead of connecting the switches via the output ports, Erimli et al. describes connecting the switches to each other via the expansion ports, which enables multiple switches to be cascaded together as a separate backbone network⁴.

Erimli et al. fails to describe data transmission between the switches via the expansion ports in greater detail. Instead, as described above, Erimli et al. teaches transmission of data between network stations via a switch. The Erimli et al. reference describes completing transmission of a first data packet and then transmitting additional data packets stored in a queue when a specified pause interval has expired. Erimli et al. fails to disclose a sink port of a first cross-bar switch capable of retransmitting the same data packet when an input port of a second cross-bar switch cannot accept the data packet on a previous transmission.

Erimli et al. similarly fails to disclose the features required by Applicants' dependent claims 40-49, 51-56 and 58-62. Claims 40, 51 and 58, for example, recite that the Retry input is programmable to operate in a Hold-off mode, wherein the first sink port responds to the signal on the Retry input by discontinuing transmission on the communications link interface after transmission of a data packet is complete until the signal is altered. As described in Applicants' specification, the Retry input may operate in either a Retry mode, in which the sink port aborts

⁴ Erimli et al., Col. 5, ln. 28-32.

Application Number 10/036,762
Responsive to Office Action mailed June 30, 2005

transmission of a data packet and then retransmits the same data packet after a predetermined period of time, or a Hold-off mode, in which the sink port completes transmission of a first data packet and then transmits additional data packet after a predetermined period of time.⁵

As discussed above, Erimli et al. fails to teach a Retry input. Furthermore, Erimli et al. fails to teach a Retry input or any other input to a sink port that is programmable to operate in different modes. Erimli et al. also fails to teach a Retry Mode register, wherein a value in the Retry Mode register controls an operating mode of the Retry input, as recited by Applicants' claims 41, 52 and 59. In the Office Action, the Examiner asserted that threshold registers (500a, 500b) from FIG. 6 of the Erimli et al. reference are substantially similar to a Retry Mode register as claimed. However, Erimli et al. does not even describe operating modes of a Retry input, let alone a Retry Mode register or any other register capable of controlling an operating mode of a Retry input. Instead, Erimli et al. describes using the threshold registers to store threshold values for each output queue corresponding to the output ports.⁶

As another example, claims 44 and 45 recite the cross-bar switch including a set of data rings in communication with the set of input ports and the set of sink ports, wherein the set of data rings couples each sink port in the set of sink ports to each input port in the set of input ports. In the Office Action, the Examiner stated that Erimli et al. discloses that the switches (12a, 12b and 12c) from FIG. 1 are connected in a ring topography and that the data ring couples the switches and hence couples each sink port to each input port.

Erimli et al. describes the switches (12) as being connected to each other via expansion ports (30) that enable multiple switches to be cascaded together as a separate backbone network⁷. As can be seen by FIG. 1 of Erimli et al., this connection may be considered a ring topology in which packets may propagate from switch to switch and ultimately may traverse the ring of switches. However, Applicants' claimed invention describes a crossbar switch in which the crossbar switch itself includes data rings for transferring packets directly between the input ports and the sink ports of the same switch. Erimli et al. fails to teach or suggest that the internal architecture of any of the switches comprises a ring topology that connects the output ports within the individual switch.

⁵ Applicants' Specification, pg. 22, ln. 24 – pg. 23, ln. 4

⁶ Erimli et al., Col. 14, ll. 24-26.

⁷ Erimli et al., Col. 5, ln. 28-32.

Application Number 10/036,762
Responsive to Office Action mailed June 30, 2005

In order to support an anticipation rejection under 35 U.S.C. 102(e), it is well established that a prior art reference must disclose each and every element of a claim. This well known rule of law is commonly referred to as the "all-elements rule."⁸ If a prior art reference fails to disclose any element of a claim, then rejection under 35 U.S.C. 102(e) is improper.⁹

Erimli et al. fails to disclose each and every limitation set forth in claims 39-62. For at least these reasons, the Examiner has failed to establish a prima facie case for anticipation of Applicants' claims 39-62 under 35 U.S.C. 102(e). Applicants request withdrawal of this rejection.

CONCLUSION

All claims in this application are in condition for allowance. Applicants respectfully request reconsideration and prompt allowance of all pending claims. Please charge any additional fees or credit any overpayment to deposit account number 50-1778. The Examiner is invited to telephone the below-signed agent to discuss this application.

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⁸ See *Hybritech Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 231 USPQ 81 (CAFC 1986) ("it is axiomatic that for prior art to anticipate under 102 it has to meet every element of the claimed invention").

⁹ *Id.* See also *Lewmar Marine, Inc. v. Barient, Inc.* 827 F.2d 744, 3 USPQ2d 1766 (CAFC 1987); *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (CAFC 1990); *C.R. Bard, Inc. v. MP Systems, Inc.*, 157 F.3d 1340, 48 USPQ2d 1225 (CAFC 1998); *Oney v. Ratliff*, 182 F.3d 893, 51 USPQ2d 1697 (CAFC 1999); *Apple Computer, Inc. v. Articulate Systems, Inc.*, 234 F.3d 14, 57 USPQ2d 1057 (CAFC 2000).